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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,732	10/03/2005	Kunhiro Oda	OGOSH40USA	4329
270 7590 10/27/2010 HOWSON & HOWSON LLP 501 OFFICE CENTER DRIVE SUITE 210 FORT WASHINGTON, PA 19034				
EXAMINER FOGARTY, CAITLIN ANNE				
ART UNIT 1733		PAPER NUMBER		
NOTIFICATION DATE 10/27/2010		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@howsonandhowson.com

Office Action Summary

Application No.

10/551,732

Applicant(s)

ODA ET AL.

Examiner

CAITLIN FOGARTY

Art Unit

1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 7, 8, 13-27 and 29-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8, 21-27, 29 and 30 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 7, 14-20 and 31 is/are rejected.
- 7) ☒ Claim(s) 3 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Drafts/Person's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Withdrawn Finality

1. This Office Action is in response to the Appeal Brief filed July 28, 2010. Upon further reconsideration of the previous rejections, the Examiner has withdrawn the finality of the last Office action. However, a new grounds of rejection has been applied as set forth below.

Status of Claims

2. Claims 1 – 3, 7, 8, 13 – 27, and 29 – 31 are pending. Claims 4 – 6, 9 – 12, and 28 have been cancelled.

Status of Previous Rejections

3. The 35 U.S.C. 103(a) rejection of claims 1 – 3, 7, 8, 13 – 27, and 29 – 31 as being unpatentable over Segal et al. (US 2001/0054457 A1) has been withdrawn in view of the Appeal Brief filed July 28, 2010.

Priority

4. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Interpretation

5. The claim 1, 7, and 8 limitation of “a tantalum sputtering target having a non-recrystallized structure” is interpreted by the Examiner as a tantalum sputtering target having non-recrystallized structure present in the target, but not necessarily 100% non-recrystallized structure. The dependent claims 2 and 3 support this interpretation because they do not require 100% non-recrystallized structure.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
8. Regarding claim 1, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
10. Claims 1, 7, 17, 18, 20, and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 00/31310 (hereinafter WO '310).

With respect to instant claim 1, p. 4 line 22- p.5 line 7, p. 9 lines 4-22, and p. 10 line 14-p. 11 line 9 of WO '310 disclose a tantalum sputtering target manufactured by subjecting a molten and cast tantalum ingot to plastic working such as forging, annealing, and rolling, where at least about 80% of the tantalum metal is recrystallized. Therefore, the tantalum sputtering target of WO '310 has a maximum of 20% non-recrystallized structure which satisfies the claim 1 limitation of a non-recrystallized structure.

In regards to instant claim 7, p. 4 line 22- p.5 line 7, p. 9 lines 4-22, and p. 10 line 14-p. 11 line 9 of WO '310 disclose a method of manufacturing a tantalum sputtering target comprising the steps of subjecting a molten and cast tantalum ingot to forging, annealing, and rolling processes, and performing plastic working on the ingot where at least about 80% of the tantalum metal is recrystallized. Therefore, the tantalum sputtering target of WO '310 has a maximum of 20% non-recrystallized structure which satisfies the claim 7 limitation of a non-recrystallized structure.

Regarding instant claim 17, p. 10 line 14-p. 11 line 9 of WO '310 teaches that after plastic working, the ingot is subjected to finish processing to form a target shape.

With respect to instant claim 18, p. 10 line 14-p. 11 line 9 and p. 15 line 5-p. 16 line 9 of WO '310 disclose that the annealing is recrystallization annealing (above the recrystallization temperature of the Ta sputtering target), and that the forging and annealing processes are repeated two or more times.

In regards to instant claim 20, p. 10 line 14-p. 11 line 9 and p. 15 lines 5-18 of WO '310 teach that the annealing is recrystallization annealing at a temperature of from about 950°C to about 1500°C (about 1223K to about 1773 K) which overlaps with the instant claimed range. WO '310 also teaches specific examples of the recrystallization annealing temperature in Example 3 of 1050°C, 1150°C, and 1300°C (1323K, 1423K, and 1573K) which are all within the instant claimed range.

Regarding instant claim 31, p. 4 lines 12-26 of WO '310 disclose that the tantalum sputtering target is made of a high purity tantalum having a purity of 4N5 (99.995%) or more.

Claim Rejections - 35 USC § 103

11. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
12. Claims 2, 14 – 16, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 00/31310 (hereinafter WO '310).

WO '310 is applied to claims 1 and 7 as set forth in the above rejection.

With respect to instant claim 2, p. 4 line 22- p.5 line 7 of WO '310 discloses a tantalum sputtering target where at least about 80% of the tantalum metal is recrystallized. Therefore, the tantalum sputtering target of WO '310 has a maximum of 20% non-recrystallized structure which overlaps with the instant claimed range.

In regards to instant claims 14 – 16, WO '310 does not specifically teach the Vickers hardness of the Ta sputtering target. However, one of ordinary skill in the art would have expected the Ta sputtering target of WO '310 to have a Vickers hardness similar to that of the instant invention because it has an overlapping composition and is made using a similar method. See MPEP 2112.

Regarding instant claim 19, p. 10 line 14-p. 12 line 7 and p. 15 line 19-p. 16 line 6 of WO '310 disclose that the ingot is upset forged. WO '310 differs from instant claim 19 because it does not specifically teach that the ingot is both extend forged and upset forged. However, upset forging includes extend forging because the diameter of the workpiece is extended during upset forging. WO '310 also differs from instant claim 19 because it does not specifically teach that the extend forging and upset forging are repeatedly performed on the ingot. However, it would have been obvious to one of

ordinary skill in the art to repeat the extend and upset forging of WO '310 until a desired height of the workpiece is achieved as disclosed in p. 15 lines 22-25.

Since the claimed non-recrystallized structure range of claim 2 either overlaps or is within the ranges disclosed by WO '310, a prima facie case of obviousness exists. See MPEP 2144.05. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed non-recrystallized structure percentage from the non-recrystallized structure percentage range disclosed by WO '310 because WO '310 teaches the same utility (i.e. tantalum sputtering target) in the whole disclosed range.

Allowable Subject Matter

13. Claims 3 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not disclose a tantalum sputtering target where the non-recrystallized structure is 40% or more. It would not have been obvious to modify the prior art to achieve the claimed amount of non-recrystallized structure because the prior art teaches that at least about 80% of the tantalum metal is recrystallized which is much larger than the recrystallized structure of 60% or less in the instant claim 3. Claim 13 is dependent on claim 3 and would therefore be allowable for the same reasons as claim 3.

14. Claims 8, 21 – 27, 29 and 30 are allowed. The closest prior art does not teach the method step of annealing the ingot or billet at a temperature of 1173 K or less to provide the Ta sputtering target with a non-recrystallized structure. Rather, the prior art

of WO '310 teaches that the Ta sputtering target is annealed at a temperature of 950°C - 1150°C (1223 K to 1423 K) which is much higher than the claimed annealing temperature range. Also, the claimed temperature of 1173 K is the recrystallization temperature of the Ta sputtering target and therefore the instant claim 8 requires an annealing temperature that is at the recrystallization temperature or below. On the other hand, WO '310 requires an annealing temperature that is above the recrystallization temperature. Therefore, it would not have been obvious to one of ordinary skill in the art to anneal the Ta sputtering target of WO '310 within the instant claim 8 range because it is below the recrystallization temperature and WO '310 teaches that the target should be annealed at a temperature above the recrystallization temperature.

Response to Arguments

15. Applicant's arguments, see p. 4-15 of the Appeal Brief filed July 28, 2010, with respect to the rejection(s) of claim(s) 1-3, 7, 8, 13-27, and 29-31 under Segal et al. (US 2001/0054457 A1) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the newly found prior art reference WO 00/3130.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAITLIN FOGARTY whose telephone number is (571)270-3589. The examiner can normally be reached on Monday - Friday 8:00 AM - 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Roy King/
Supervisory Patent Examiner, Art
Unit 1733

CF